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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/881,651	06/13/2001	Michael H. Myers	2807.2.14.13	9276

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EXAMINER	
LEUNG, CHRISTINA Y	

ART UNIT	PAPER NUMBER
2633	8

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Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary	Application No.	Applicant(s)
	09/881,651	MYERS, MICHAEL H.
	Examiner	Art Unit
	Christina Y. Leung	2633

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 13 June 2001.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-20 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-20 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 13 June 2001 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 4.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Falk et al. (US 4,860,279 A) in view of Roberts (US 6,128,111 A).

Regarding claim 1, Falk et al. disclose an apparatus for multiplexing (Figure 3), the apparatus comprising:

first and second lasers (light sources 106(1) and 106(2), which may comprise lasers; column 1, lines 20-21);

first and second digital data signals (input via terminals 104(1) and 104(2));

first and second photonic modulators configured to modulate the first and second lasers with the first and second digital data signals, providing first and second modulated photonic signals (Falk et al. disclose that the light sources 106 are switched on and off according to the digital data signals and thus act as modulators; column 5, lines 7-20);

first and second delay mechanisms configured to provide delayed copies of the first and second modulated photonic signals, delayed by first and second delays (the longer of the two arms in each interferometer 102(1) or 102(2) provides a delayed copy of the incoming signal; column 5, lines 20-31), respectively; and

combiners configured to combine the delayed copies with the first and second modulated signals to form first and second consolidated modulated signals, respectively (each interferometer combines the modulated signal on the shorter arm with the delayed copy of that signal on the longer arm to form a consolidated signal; column 5, lines 20-31).

Falk et al. do not specifically disclose a control module configured to adjust the power of the first and second consolidated signals by first and second weights, respectively, corresponding to the quality of service required by first and second users.

However, Roberts teaches a system (Figure 1) including multiplexed modulated optical signals such as in the one disclosed by Falk et al. Roberts further teaches that the power levels of the optical signals in such a system are ideally high enough to achieve a sufficient signal to noise ratio at a user's receiver, yet not so high that nonlinear effects degrade the signal during the transmission to that user (column 1, lines 13-34). In order to obtain ideal power levels in the optical signals, Roberts teaches a control module 16 that adjusts the power of first and second transmitted signals corresponding to the quality of service required by the users at the receiving end (column 5, lines 17-29). Examiner notes that Roberts teaches that the control module 16 may adjust each of the signals differently, or in other words, by different respective "weights," according to the feedback corresponding to the quality requirements at the receiving end.

It would have been obvious to a person of ordinary skill in the art to include a control module such as taught by Roberts in the system disclosed by Falk et al. to adjust the power of the first and second consolidated signals so that they may be optimally received by users. One in the art would have been particularly motivated to combine the control module taught by Roberts

with the system disclosed by Falk et al. because Falk et al. discloses multiplexing signals over a fiber medium and Roberts specifically teaches optimizing signals transmitted in that manner.

Regarding claim 2, Falk et al. disclose a multiplexing combiner 124 configured to combine the first and second consolidated modulated signals.

Regarding claim 3, Falk et al. disclose an output line (such as waveguide 126) configured to transmit the multiplexed output toward a destination over a carrier medium (fiber 118).

Regarding claim 4, Falk et al. disclose (Figures 4 and 5) a splitter located at the destination and configured to receive from the carrier medium and split the multiplexed output into first and second daughter signals (such as splitter 240 shown in Figure 4).

Regarding claim 5, Falk et al. disclose third and fourth delay mechanisms configured to provide first and second delayed copies of the first and second daughter signals, delayed by the first and second delays, respectively (the longer of the two arms in each interferometer 202(1) or 202(2) in Figure 4 provides a delayed copy of the incoming signal; column 5, lines 54-68; column 6, lines 1-3).

Regarding claim 6, Falk et al. disclose a first detector configured to extract the first digital data signal from the first daughter signal and the first delayed copy; and second detector configured to extract the second digital data signal from the second daughter signal and the second delayed copy. Figure 4, for example, shows a first detector comprising photodetectors 204(1) and 206(1), and differential amplifier 208)(1), for extracting the first digital data signal and shows a similarly constructed second detector for extracting the second digital data signal. Figure 5 further shows an alternative embodiment using single photodetectors 304(1) and 304(2) for extracting the first and second data signals, respectively.

Regarding claim 7, Falk et al. disclose that the carrier medium 118 is an optical fiber (column 5, line 42).

Regarding claim 8, Falk et al. in view of Roberts describe a system as discussed above with regard to claims 1-7. Falk et al. do not disclose that the first and second modulated photonic signals are encoded using orthogonal codes. However, Roberts further teaches encoding transmitted signals with orthogonal codes to provide a monitor/dither signal (column 5, lines 49-67; column 6, lines 1-7). It would have been obvious to a person of ordinary skill in the art to encode the first and second signals using orthogonal codes as taught by Roberts in the system described by Falk in view of Roberts in order to provide monitor signals that can be easily recovered at the receiver to provide feedback for the control module already discussed with regard to claim 1. Examiner notes that claim 8 does not further recite details regarding the orthogonal codes.

Regarding claim 9, Falk et al. disclose that the first and second consolidated modulated signals are combined into a multiplexed output (using coupler 124) and transmitted across a carrier medium (fiber 118).

Regarding claim 10, Falk et al. disclose a multiplexing combiner (coupler 124 shown in Figure 3) operably connected to combine the first and second consolidated modulated signals into a multiplexed output; and a splitter (splitter 240 shown in Figure 4), further configured to receive and split the multiplexed output into first and second daughter signals.

Regarding claim 11 (as similarly discussed above with regard to claim 5), Falk et al. disclose third and fourth delay mechanisms configured to provide first and second delayed copies of the first and second daughter signals, delayed by the first and second delays,

respectively (the longer of the two arms in each interferometer 202(1) or 202(2) in Figure 4 provides a delayed copy of the incoming signal; column 5, lines 54-68; column 6, lines 1-3).

Regarding claim 12 (as similarly discussed above with regard to claim 6), Falk et al. disclose a first detector configured to extract the first digital data signal from the first daughter signal and the first delayed copy; and a second detector configured to extract the second digital data signal from the second daughter signal and the second delayed copy. Figure 4, for example, shows a first detector comprising photodetectors 204(1) and 206(1), and differential amplifier 208)(1), for extracting the first digital data signal and shows a similarly constructed second detector for extracting the second digital data signal. Figure 5 further shows an alternative embodiment using single photodetectors 304(1) and 304(2) for extracting the first and second data signals, respectively.

Regarding claim 13, Falk et al. disclose (Figure 3) a method for coherence multiplexing, the method comprising:

providing first and second lasers (light sources 106(1) and 106(2), which may comprise lasers; column1 , lines 20-21);

providing first and second digital data signals (through input terminals 104(1) and 104(2));

modulating the first and second lasers with the first and second digital data signals to provide first and second modulated photonic signals (column 5, lines 7-20); and

providing delayed copies of the first and second modulated photonic signals, delayed by first and second delays, respectively, the delayed copies being recombined with the first and second modulated signals to form first and second consolidated modulated signals (the longer of

the two arms in each interferometer 102(1) or 102(2) provides a delayed copy of the incoming signal, and each interferometer combines the modulated signal on the shorter arm with the delayed copy of that signal on the longer arm to form a consolidated signal; column 5, lines 20-31).

Falk et al. do not specifically disclose adjusting the power of the first and second consolidated signals by first and second weights, respectively, corresponding to the quality of service required by first and second users, respectively.

However, as similarly discussed above with regard to claim 1, Roberts teaches a system (Figure 1) including multiplexed modulated optical signals such as in the one disclosed by Falk et al. Roberts further teaches that the power levels of the optical signals in such a system are ideally high enough to achieve a sufficient signal to noise ratio at a user's receiver, yet not so high that nonlinear effects degrade the signal during the transmission to that user (column 1, lines 13-34). In order to obtain ideal power levels in the optical signals, Roberts teaches a control module 16 that adjusts the power of first and second transmitted signals corresponding to the quality of service required by the users at the receiving end (column 5, lines 17-29). Examiner notes that Roberts teaches that the control module 16 may adjust each of the signals differently, or in other words, by different respective "weights," according to the feedback corresponding to the quality requirements at the receiving end.

It would have been obvious to a person of ordinary skill in the art to include adjusting the power of the signals such as taught by Roberts in the method disclosed by Falk et al. so that the first and second consolidated signals may be optimally received by users. One in the art would have been particularly motivated to combine the adjusting step taught by Roberts with the

method disclosed by Falk et al. because Falk et al. discloses multiplexing signals over a fiber medium and Roberts specifically teaches optimizing signals transmitted in that manner.

Regarding claim 14, Falk et al. disclose combining the first and second consolidated modulated signals into a multiplexed output (using coupler 124).

Regarding claim 15, Falk et al. disclose transmitting the multiplexed output over a carrier medium (fiber 118).

Regarding claim 16. Falk et al. disclose splitting the multiplexed output into first and second daughter signals (using splitter 240 in Figure 4).

Regarding claim 17, Falk et al. disclose providing first and second delayed copies of the first and second daughter signals, delayed by the first and second delays, respectively (the longer of the two arms in each interferometer 202(1) or 202(2) in Figure 4 provides a delayed copy of the incoming signal; column 5, lines 54-68; column 6, lines 1-3).

Regarding claim 18, Falk et al. disclose extracting the first digital data signal from the first daughter signal and the first delayed copy; and extracting the second digital data signal from the second daughter signal and the second delayed copy. Figure 4, for example, shows a first detector comprising photodetectors 204(1) and 206(1), and differential amplifier 208)(1), for extracting the first digital data signal and shows a similarly constructed second detector for extracting the second digital data signal.

Regarding claim 19, Falk et al. disclose that the carrier medium 118 is an optical fiber (column 5, line 42).

Regarding claim 20, Falk et al. in view of Roberts describe a method as discussed above with regard to claims 13-19. Falk et al. do not disclose that the first and second modulated

photonic signals are encoded using orthogonal codes. However, Roberts further teaches encoding transmitted signals with orthogonal codes to provide a monitor/dither signal (column 5, lines 49-67; column 6, lines 1-7). It would have been obvious to a person of ordinary skill in the art to encode the first and second signals using orthogonal codes as taught by Roberts in the method described by Falk in view of Roberts in order to provide monitor signals that can be easily recovered at the receiver to provide feedback for the control module already discussed with regard to claim 13. Examiner notes that claim 20 does not further recite details regarding the orthogonal codes.

Conclusion

3. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christina Y. Leung whose telephone number is 703-605-1186. The examiner can normally be reached on Monday to Friday, 6:30 to 3:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on 703-305-4729. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-4700.

JASON CHAN
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